Preventing heavy episodic drinking among youth and young adults: A literature review

AADAC Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

RESEARCH SERVICES

Preventing heavy episodic drinking among youth and young adults: A literature review

March 2005

Alberta Alcohol and Drug Abuse Commission (AADAC)

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Suggested citation:

Alberta Alcohol and Drug Abuse Commission. (2005). Preventing heavy episodic drinking among youth and young adults: A literature review. Edmonton, Alberta, Canada: Author.

105-07624/

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Executive summary

The focus of this literature review is on heavy episodic drinking, or binge drinking, among youth and young adults aged 15 to 29, and on strategies that have been shown to decrease the prevalence of heavy episodic drinking. Heavy episodic drinking is commonly defined as the consumption of five drinks in one sitting for men and four drinks in one sitting for women. This pattern of drinking is associated with a range of negative academic, social and health effects as well as second-hand effects experienced by those in the presence of heavy episodic drinkers.

Canadian research indicates an increase in heavy episodic drinking rates over the 1990s, from a low of 18% in 1993 to an all-time high of 28% in 1999. The Alberta Youth Experience Survey found that of students in grades 7 to 12 who are drinkers, 17.4% drank five or more drinks on one occasion about once a month, and 13.7% did so about once a week or more. Among post-secondary students, 72.1% of Canadian university students aged 19 to 24 years reported drinking five or more drinks at least once in the past 12 months. Some research suggests that university and college populations have higher heavy episodic drinking rates than the general population, but not all research supports this conclusion.

Those most likely to binge drink and to do so more frequently are

- males
- students living on campus
- students belonging to fraternities or sororities
- first-year post-secondary students
- post-secondary athletes

Other groups of concern are women, Aboriginal people, and rural youth.

- Women are at increased risk for some problems related to heavy episodic drinking, including sexual assault and unplanned pregnancies. Women's rates of heavy episodic drinking may be increasing.
- Aboriginal youth are also a population of concern given the high rates of alcohol use and abuse among Aboriginal populations.
- Rural youth generally experience more problems from their drinking, particularly with regard to drinking and driving.

Most college and university campuses in Canada and the U.S. have some form of alcohol use prevention, intervention, or education program. Some approaches to reducing heavy episodic drinking focus on the individual, while other approaches focus on the environment in which students binge drink.

Individual-focused approaches

- traditional education or information campaigns (These have generally been found to be ineffective on their own, but they may be an important *supporting* strategy.)
- social norms approaches (Research findings are mixed on the effectiveness of social norms campaigns; some suggest this approach may be most effective if targeted at students who are already binge drinking.)
- changing a person's alcohol expectancies, or beliefs about the positive and negative effects of alcohol
- developing a person's moderate drinking skills
- providing personalized feedback and brief interventions

Environmental approaches

On-campus strategies include

- using media campaigns (This may be successful in raising awareness of an issue, but less often result in changed behaviour.)
- providing substance-free housing
- sponsoring various alcohol-free events on campus (This may be more successful with non-heavy drinkers.)
- restricting advertising (Findings are mixed as to the effectiveness of this approach.)
- building social capital on campus
- enhancing academic expectations (for example, by scheduling classes on Friday)
- making students aware of campus alcohol policies and enforcing them consistently
- prohibiting alcohol on campus (This approach is generally not supported in the literature.)

Off-campus strategies include

- increasing the price of alcohol (The price of alcohol is known to correlate with alcohol consumption, especially for young people.)
- requiring warning labels on alcoholic beverages (Some research suggests labels have little or no effect on risk perception or drinking behaviour.)
- raising the minimum drinking age (Research is not conclusive as to the effectiveness of raising the minimum drinking age.)
- restricting the hours of service and days of sale for alcohol outlets

- influencing the activities and environment of bars and clubs to discourage heavy episodic drinking
- regulating the density of alcohol outlets around campuses
- requiring server training and emphasizing responsible server practices (Some research has not found this approach to be effective.)

There are many options to choose from when designing a strategy to prevent and reduce heavy episodic drinking among youth and young adults. Regardless of the approach taken, researchers recommend involving students, faculty and staff, and the surrounding community in the planning and implementing of the strategy. Targeted approaches that focus on members of fraternities and sororities, athletes, first-year students and other high-risk groups are also recommended, as well as using a multi-faceted approach.

Introduction

This review of the literature on heavy episodic or binge drinking was conducted to assist the Alberta Alcohol and Drug Abuse Commission (AADAC) in addressing heavy episodic drinking among youth and young adults. The focus of the review was on youth and young adults aged 15 to 29, and on best practices or strategies that have been shown to decrease the prevalence of heavy episodic drinking.

This report begins by discussing prevalence of heavy episodic drinking (with an emphasis on Canadian data), and associated risk factors. The majority of the report then focuses on prevention and reduction strategies. Nearly all of the literature on preventing heavy episodic drinking or reducing the prevalence of heavy episodic drinking among young adults is focused on university or college environments, with a small number of studies on secondary school settings. In addition, most of this research is from the United States. This review reflects these particular concentrations of literature.

Defining heavy episodic drinking

The most common definition of heavy episodic or binge drinking is the consumption of five drinks in one sitting for men and four drinks in one sitting for women at least once in a two-week period (Wechsler, Nelson, & Weitzman, 2000; Schulenberg, Wadsworth, O'Malley, Bachman, & Johnston, 1997; Marlatt & Baer, 1997). This definition was established by the Harvard School of Public Health for its College Alcohol Study. While the two-week time period is frequently used to classify binge drinkers, the time period can vary from two weeks to three months depending on the study (Vik, Cellucci, & Ivers, 2003).[1] Binge drinkers can be further classified as frequent or occasional binge drinkers (Wechsler & Kuo, 2000).

In Canadian research – Heavy episodic drinking has been defined in various ways in Canadian research. The Ontario Student Drug Use Survey defines heavy episodic drinking as having consumed five or more drinks on one occasion in the last four weeks. The CAMH Monitor and the Canadian Campus Survey define it as having five or more drinks on one occasion at least once in the past 12 months (Centre for Addiction and Mental Health, 2002a).

Arguments for and against the term "binge drinking" and the 5/4 definition – Use of the term "binge drinking" and the definition of five drinks for men, four drinks for women have been criticized by some researchers (Lederman, Stewart, Goodhart, & Laitman, 2003; DeJong, 2001). They suggest using other terms such as "heavy episodic," "high-risk," "dangerous" or "immoderate" drinking, and a definition that would account for factors that moderate alcohol's effect (such as time period

[1] Other definitions exist as well. The Australian National Health and Medical Research Council defines binge drinking as four or more standard drinks for women and six or more standard drinks for men per drinking period (Oei & Morawska, 2004). The London Health Education Authority defines binge drinking as consuming half the recommended weekly consumption (14 units of alcohol for women, 21 for men) in one session (Norman, Bennett, & Lewis, 1998).

of consumption, and whether or not food is consumed). The term and definition were defended by other researchers for several years; however, in a recent publication, the strongest proponent of the term switched to "heavy episodic drinking" though keeping the definition of five drinks for men, four drinks for women (Wechsler et al., 2003). (See Appendix I for a more detailed discussion of the arguments for and against the term "binge drinking" and the definition).

Harmful outcomes of heavy episodic drinking

The academic, social, and health effects of heavy episodic drinking are well documented in the literature and are only given brief treatment here.

- The Canadian Campus Survey (Gliksman, Adlaf, Demers, Newton-Taylor, & Schmidt, 2000) found students reported the following consequences of heavy episodic drinking:
  - having a hangover (37.6%)
  - regretting their actions (12.6%)
  - memory loss (11.2%)
  - missing classes due to a hangover (10.5%)
  - missing classes due to drinking (7.3%)
  - unplanned sexual relations (6.5%)
  - driving a car after drinking too much (4.9%)
  - drinking while driving (3.3%)
  - having unsafe sex (2.7%)
- A U.S. study notes that binge drinkers are 7 to 10 times more likely than non-bingers to engage in unsafe sexual practices, suffer an injury, or drive while drunk (Correia, Carey, Simons, & Borsari, 2003).
- Oesterle et al. (2004) found that people who were heavy episodic drinkers in adolescence were more likely to experience negative health effects (such as obesity and high blood pressure), and to have poor health practices (such as unsafe driving practices), at age 24.

Another area of study is second-hand effects of heavy episodic drinking. Environmental and public health approaches to heavy episodic drinking tend to focus on the second-hand effects. These approaches are similar to drunk-driving or anti-smoking campaigns where non-drinkers or non-smokers advocate for their rights.

- Second-hand effects from heavy episodic drinking include disruption of sleep and studying, fights, insults and arguments, vandalism, physical assaults, and unwanted sexual advances (Bishop, 2000; Clapp, Shillington, & Segars, 2000; Wechsler et al., 2000).

- Wechsler, Nelson, and Weitzman (2000) found that "non-binging students who attend schools in which more than half of the students binge drink are more than twice as likely to report...second-hand effects...than are students in schools with fewer binge drinkers" (p.40).
- Communities may also experience second-hand effects of heavy episodic drinking, such as litter, noise and vandalism (Wechsler, Lee, Hall, Wagenaar, & Lee, 2002).
- The website www.HadEnough.org advocates for protection of non-binge drinkers from the second-hand effects of binge drinking (Vicary & Karshin, 2002).

Methods

Searches for "binge drinking," "heavy episodic drinking," and "heavy drinking" were conducted in five databases: ERIC (Educational Resources Information Center), Sociological Abstracts, Social Services Abstracts, PsycINFO, and CINAHL (Cumulative Index to Nursing and Allied Health Literature). Only literature published in 2000 or more recently was considered, with the exception of a few key articles published prior to 2000. Articles on prevention or interventions were prioritized for review.

As well, the websites of major Canadian and American addictions organizations were searched, such as Canadian Centre on Substance Abuse (CCSA), Centre for Addiction and Mental Health (CAMH), Substance Abuse and Mental Health Services Administration (SAMHSA), National Institute on Alcohol Abuse and Alcoholism (NIAAA), Virtual Clearinghouse on Alcohol Tobacco and Other Drugs, and the Alcohol Policy Network (APOLNET).

Limits of the literature review

Prevention of heavy episodic drinking among youth and young adults is one issue under the larger prevention umbrella. The focus of this review is on prevention of heavy episodic drinking specifically, and it was outside of the scope of this review to look at best practices in prevention in general. Best practices of prevention are well documented in literature such as Health Canada's document on best practices in preventing substance use problems among young people (Roberts et al., 2001).

Two populations of interest with regard to heavy episodic drinking are women—because of the possibility of the birth of babies affected by fetal alcohol spectrum disorder (FASD) if women drink while pregnant—and Aboriginal youth and young adults, because of the high rates of substance use among this population. It was beyond the scope of this report to review the extensive literature on both of these populations. Best practices, policies, and reviews of programs and services exist for both of these populations with regard to substance use (Health Canada, 1999, 2001a, 2001d; McKenzie, 1995; Rutman, Callahan, Lundquist, Jackson, & Field, 2000).

Prevalence and risk factors of heavy episodic drinking

Prevalence of heavy episodic drinking

Junior and senior high school students

- The Alberta Youth Experience Survey reported that of students in grades 7 to 12 who are drinkers, about one quarter (26.5%) drank five or more drinks on one occasion less than once a month, 17.4% drank this amount about once a month, and 13.7% did so about once a week or more (Alberta Alcohol and Drug Abuse Commission [AADAC], in press).
- According to the most recent Canadian Community Health Survey, 35.8% of Alberta respondents aged 15 to 19 years reported that they had consumed five or more drinks on one occasion 12 or more times a year, compared with 30.5% of Canadian respondents of the same age group (Statistics Canada, 2003).
- CAMH reported that 27.5% of students in grades 7 to 13 reported binge drinking (having five or more drinks on one occasion) at least once during the four weeks before the survey, and 6.2% reported binge drinking at least four times during the same time period (Centre for Addiction and Mental Health, 2002a).

U.S. data for this age group show similar findings:

- In a 2003 survey, 28.3% of students in grades 9 to 12 reported drinking five drinks or more in a row (i.e., within a couple of hours) once or more in the 30 days preceding the survey (Centers for Disease Control, 2004).
- Monitoring the Future, a national survey of U.S. high school students, reported that 30% of 12th graders, just over 20% of 10th graders, and around 15% of eighth graders reported drinking five or more drinks in a row in the two weeks before the survey (Johnston, O'Malley, Bachman, & Schulenberg, 2003).

University and college students

- CAMH reported that 72.1% of Ontario university students aged 19 to 24 (surveyed in 1998) drank five or more drinks at least once in the past 12 months, compared with 72.9% of their Ontario general-population counterparts (surveyed in 2001) (Centre for Addiction and Mental Health, 2002a).
- About 6% of Ontario university students between the ages of 19 and 34 had five or more drinks on one occasion at least 50 times during the past 12 months (Centre for Addiction and Mental Health, 2002a).

- In the 2001 Harvard School of Public Health College Alcohol Study, 44.4% of students reported drinking five drinks (for men) or four drinks (for women) in the two weeks before the survey (Wechsler, Lee, Kuo, et al., 2002).

General population

- In the Canadian Community Health Survey 2003, 41.6% of Alberta respondents aged 20 to 24 reported that they had consumed five or more drinks on one occasion 12 or more times in the previous year, compared with 41.4% of Canadian respondents of the same age (Statistics Canada, 2003).
- In a 2001 survey of Ontario's general population aged 19 to 24, 72.9% of respondents reported binge drinking (having five or more drinks in one occasion) at least once in the previous 12 months (Centre for Addiction and Mental Health, 2002a).
- Among Ontario adults surveyed in the CAMH Monitor, 28% reported having five or more drinks in one occasion once a month or more often, and 12.2% reported having five or more drinks in one occasion once a week or more often during the past 12 months (Centre for Addiction and Mental Health, 2002a).
- Of all adult age groups in Ontario, 18- to 29-year-olds reported the highest rates of binge drinking (defined as having five or more drinks on one occasion) on a weekly basis during the past 12 months (18% in 2001) (Centre for Addiction and Mental Health, 2002b).

Comparing post-secondary population with general population

It is difficult to compare heavy episodic drinking rates among post-secondary populations with those among the general population using the available data, because of inconsistencies in measurements, time frames and age groups.

- One conclusion that can be drawn is that rates for infrequent heavy episodic drinking (i.e., at least once in the past 12 months) were similar among Ontario university students and Ontario's general population aged 19 to 24.
- Several studies in the U.S. suggest that university and college populations have higher heavy episodic drinking rates than the general population (Marlatt & Baer, 1997; Odo, McQuiller, & Stretesky, 1999; Wechsler, Lee, Kuo, et al., 2002; Oei & Morawska, 2004).

Trends over time

Canadian research indicates an increase in heavy episodic drinking rates since the early 1990s.

- CAMH reports that the late 1970s was a peak time for binge drinking (defined as consuming five or more drinks on a single occasion during

the four weeks before the survey) among Ontario students in elementary and secondary schools, followed by a general decline to a low of 18% in 1993. Binge drinking rates then increased for this population to an all-time high of 28% in 1999, and showed a non-significant decrease between 1999 and 2001 (Centre for Addiction and Mental Health, 2002b; Adlaf & Paglia, 2001).

- Among Ontario adults, weekly binge drinking rates were stable between 1977 and 1995 (just under 10%), and have since increased significantly, particularly among males and 18- to 29-year-olds (Centre for Addiction and Mental Health, 2002b).
- U.S. research on the college population suggests there has been no significant change in binge drinking rates since the early 1990s, with 43.9% of students reporting drinking five drinks for men or four drinks for women in the two weeks before the survey in 1993, and 44.4% reporting this drinking behaviour in 2001 (Wechsler, Lee, Kuo, et al., 2002). The authors note that the "lack of change in binge drinking among college students since 1993 is notable, given the significant efforts to combat this problem" during this time (p. 215).
- This same study reported lower rates of current drinkers, but a polarization of abstainers and frequent binge drinkers. In other words, there were more students either abstaining or binge drinking frequently, but fewer students drinking moderately (Wechsler, Lee, Kuo, et al., 2002).
- Recent news articles from the United Kingdom also cite rising levels of binge drinking among young people, although the number of people younger than 16 who drink has not gone up (Pincock, 2003). Factors thought to be contributing to the rise in binge drinking rates include cheaper and more accessible alcohol, changing drinking patterns, and a jump in drinking among young women. U.K. officials are trying to address the problem by increasing penalties for drunken behaviour, requiring pubs and clubs to hire extra police officers, and extending pub hours to discourage binge drinking at "last call" (Brits Concerned About Binge Drinking, 2004).

Risk factors for heavy episodic drinking

Gender

Men are more likely than women to binge drink, and to do so more frequently (AADAC, 2003, 2004, in press; Centre for Addiction and Mental Health, 2002a; Marlatt & Baer, 1997; Schulenberg et al., 1997; Wechsler, Lee, Kuo, et al., 2002; Weitzman, Nelson, & Wechsler, 2003).

- The Canadian Campus Survey reported that men were significantly more likely than women to report heavy drinking as measured by consuming five or more (70.6% versus 56.1%) and eight or more

drinks (46.5% versus 25.2%) on a single occasion at least once since the start of the fall semester (Gliksman et al., 2000).

- According to the Canadian Community Health Survey, "in Alberta, men are about twice as likely as women to binge drink once or more per month (39.2% versus 18.1%), and are about three times as likely to binge drink once or more per week (14.6% versus 4.8%)" (AADAC, 2004, p. 27). Binge drinking was defined as having five or more drinks on one occasion, and respondents were between the ages of 18 and 44.

Issues for women and heavy episodic drinking – Although women are less likely than men to be heavy episodic drinkers, they are a population of concern because they are at increased risk for some problems related to this behaviour (Vicary & Karshin, 2002).

- Apart from their physical health, which is "affected more severely and in a shorter period of time by intensive substance use" (Health Canada, 2001b, p. 11), women also experience a greater number of problems at the same consumption rate as men (Wechsler et al., 2000).
- Heavy alcohol use is associated with sexual assault and date rape (Marlatt & Baer, 1997; Wechsler et al., 2000).
- Health Canada reports that "women who drink a higher number of drinks per occasion tend to be younger, have lower educational attainment, have lower incomes, be single or divorced, be unemployed, a student or in a blue collar job" (Health Canada, 2001b, p. 10).

Of particular concern for women who binge drink is the risk of unplanned pregnancy, which, if carried to term, may result in a child being affected by fetal alcohol spectrum disorder (FASD).

- In the Canadian Community Health Survey, 10.3% of Alberta women who were pregnant at the time of the survey reported drinking five or more drinks at a time once or more per month. Less than 1% (0.9%) of women who were pregnant at the time of the survey reported binge drinking once or more per week (AADAC, 2004).[2] Binge drinking was defined as having five or more drinks on one occasion, and respondents were between the ages of 18 and 44.
- According to the Canadian Community Health Survey, binge drinking once or more per week was more common among Alberta women aged 18 to 21 (14.1%) than among women aged 21 to 25 (6.2%), or women aged 26 to 45 (3.0%) (AADAC, 2004).

[2] Many of the survey questions used a 12-month time frame and did not distinguish between alcohol use during that time frame when the respondent was pregnant and when she was not. Thus, "reported rates of substance use among pregnant women may be higher than if the question had focused more narrowly on substance use *during* the pregnancy" (AADAC, 2004, p. 23).

- FASD most commonly affects children whose mothers have low socioeconomic status, and in Canada, Aboriginal people. Low socioeconomic status "enables other risk factors such as drug abuse, multiple parity and poor nutrition to compound the effects of alcohol on the fetus" (Nanson, 1997, p. 808).
- A study of pregnancies resulting in live birth found that female binge drinkers may unknowingly expose their fetuses to high concentrations of alcohol during the period after conception but before pregnancy confirmation, which occurred at a median gestational age of five weeks in the study (Naimi, Lipscomb, Brewer, & Gilbert, 2003).
- This study also found that preconception binge drinkers were more likely than non-binge drinkers "to consume alcohol, binge drink, and smoke after their pregnancy was established" (Naimi et al., 2003, pp. 1139-1140).

Women's rates of heavy episodic drinking may be increasing.

- An analysis by the National Organization on Fetal Alcohol Syndrome of data from the Centers for Disease Control and Prevention revealed that binge drinking (having five or more drinks on one occasion) in U.S. women aged 18 to 44 increased 13% between 1999 and 2002 (National Organization on Fetal Alcohol Syndrome, 2004).
- The Harvard School of Public Health College Alcohol Study reported that in 1993, students in all women's colleges had much lower rates of binge drinking, but since that time students at these schools have reported significant increases in frequent binge drinking and are now narrowing the gap in drinking behaviour between all-women's colleges and coeducational schools (Wechsler, Lee, Kuo, et al., 2002).

Age or year of college/university

- Data from The Alberta Youth Experience Survey revealed that frequency of drinking heavily-defined as drinking five or more drinks on one occasion-increased with grade (AADAC, in press).
- The Canadian Campus Survey did not show an association between year of study and binge drinking rates (AADAC, 2004).
- U.S. research found that underage students (under 21) are a high-risk group for binge drinking (Wechsler & Kuo, 2003).
- Wechsler, Lee, Nelson and Kuo (2002) found that underage students in the U.S. (under 21) have different drinking patterns than of-age students. For example, though underage students drink less frequently, they are more likely to report that they usually drink at binge levels when they drink. They are also more likely to report drinking "to get drunk" as an important reason for drinking. Underage drinkers were more likely to experience some problems related to alcohol use, such as doing something they regretted, forgetting where they were or what

they did, causing property damage, getting into trouble with the police, or getting hurt or injured. Underage students were more likely to live on campus, a risk factor for binge drinking.

- Research in the U.S. found that for high school students who do not go on to college, "binge drinking tends to reach its peak during high school and then decline thereafter" (Schulenberg et al., 2001, p. 473). Baer, Kivlahan, and Marlatt (1995) suggest "the most severe adolescent drinkers may be unlikely to enter college" (p. 54).
- High-school students who do go on to college drink less than their non-college-bound peers during high school, but their binge drinking escalates quickly in their first year of college and does not decline until their early 20s as they leave college (Schulenberg et al., 2001). Thus, the first year of college presents a critical opportunity for prevention interventions (Werch et al., 2000).
- The majority of young adults "mature out" of heavy drinking as they get older and assume adult responsibility (Marlatt & Baer, 1997; Vik et al., 2003).

Race

White post-secondary students were found to have the highest levels of heavy episodic drinking (Centers for Diseases Control, 2004; Schulenberg et al., 1997; Vicary & Karshin, 2002; Wechsler & Kuo, 2003; Weitzman et al., 2003).

Heavy episodic drinking among Aboriginal youth and young adults – Though data on heavy episodic drinking rates per se among Aboriginal youth and young adults were not available, the literature clearly identifies high rates of alcohol use and abuse among Aboriginal populations.

- Health Canada reports that Aboriginal youth are at two to six times greater risk for every alcohol-related problem than their counterparts in the general population, and that they begin using alcohol at a much earlier age than non-Aboriginal youth (Health Canada, 2001c; see also Health Canada, 2003; Kerr, 2001).
- The Alberta Youth Experience Survey reported that a higher percentage of Aboriginal youth (65%) than non-Aboriginal youth (53%) were current drinkers, and a higher percentage of Aboriginal than non-Aboriginal youth (35% and 12% respectively) reported signs of alcohol abuse (AADAC, 2003).

Health Canada suggests that Aboriginal youth require programs that incorporate traditional beliefs and practices from the Aboriginal community and that address spiritual needs, practices, and beliefs (Health Canada, 2001c).

Residence (on campus, fraternities or sororities)

Students living on campus, and those belonging to fraternities or sororities, have higher rates of heavy episodic drinking.

- According to the Canadian Campus Survey, students living on campus were significantly more likely to have more episodes of five or more drinks on a single occasion (6.7 times since the start of the fall semester) than students living off campus with family members (4.0 times) or without family (4.8 times) (Gliksman et al., 2000).
- Studies in the U.S. have shown that fraternity and sorority members and students living on campus in residences have significantly higher levels of binge drinking than other students, with the exception of students living in alcohol-free residences (Baer et al., 1995; Marlatt & Baer, 1997; Vicary & Karshin, 2002; Wechsler, Lee, Kuo, et al., 2002; Weitzman et al., 2003).

Athletes

Studies in the U.S. have also found that athletes have higher levels of heavy episodic drinking than the general student population (Vicary & Karshin, 2002; Wechsler, Lee, Kuo, et al., 2002)

Rural and urban youth

There are differing findings as to rates of alcohol use for rural versus urban youth.

- According to The Alberta Youth Experience Survey, a lower percentage of youth from rural areas (51%) were current drinkers compared with youth in towns and most cities, and youth in larger cities were more likely than youth in rural areas (15% versus 11%) to report signs of alcohol abuse (AADAC, 2003).
- However, other studies suggest that rural youth may drink more heavily than their urban counterparts, and are more likely to binge drink and drink more heavily during their binges (Kerr, 2001). One Ontario study reported that among northern Ontario (primarily rural) youth aged 12 to 18 who drink, 59.2% had participated in binge drinking, compared with the provincial norm of 45.1% (Northern Health Information Partnership, 2003).

There is greater consensus that rural youth experience more problems from their drinking, particularly with regard to drinking and driving.

- An Alberta study suggested that although alcohol use may be equally prevalent among rural and urban teenagers, teenage drinking and driving may be more widespread in rural areas, particularly among older youth and among males (Drixler, Krahn, & Wood, 2001; see also Kerr, 2001; Northern Health Information Partnership, 2003).

One study that reviewed programs aimed at rural youth suggested the following:

- Programs must be specific to the community's needs, accounting for diversity of rural communities, and culture of target groups.
- Building infrastructure may be the first step of prevention in communities where resources do not exist (for example, networking, training addictions professionals, establishing services).
- Harm reduction approaches may be most appropriate because there is more acceptance in rural communities of young people's drinking (Kerr, 2001).

Other risk factors

Although an exhaustive review of the literature on risk or predictive factors of heavy episodic drinking was beyond the scope of this report, the following additional risk factors were identified in the literature reviewed.

Personal risk factors

- history of conduct problems (Baer et al., 1995; Marlatt & Baer, 1997; Vicary & Karshin, 2002)
- impulsiveness, thrill seeking, high levels of sensation seeking (Vicary & Karshin, 2002; Yanovitzky & Stryker, 2001)
- unconventionality (Schulenberg et al., 1997; Yanovitzky & Stryker, 2001)
- little belief in one's capabilities to produce effects, or self-efficacy (e.g., "When I make plans, I am not certain that I can make them work.") (Blume, Schmaling, & Marlatt, 2003; Schulenberg et al., 1997)
- inflated perceptions of friends' binge drinking levels (Weitzman et al., 2003)
- holding "wet" attitudes (inflated thresholds for defining binge drinking and a belief that the legal drinking age should be lowered) (Weitzman et al., 2003)

Environmental risk factors

- peer influences (Vicary & Karshin, 2002; Yanovitzky & Stryker, 2001)
- family history of alcoholism (Baer et al., 1995; Marlatt & Baer, 1997; Vicary & Karshin, 2002; Yanovitzky & Stryker, 2001)
- living in a "wet" setting (e.g., non-substance-free dormitory, college with high level of heavy episodic drinking, fraternity or sorority) (Weitzman et al., 2003)

Preventing and reducing heavy episodic drinking

Introduction

Nearly all of the literature on preventing heavy episodic drinking or reducing the prevalence of heavy episodic drinking among young adults is focused on university or college environments, with a small number of studies on secondary school settings. Thus, the following review focuses on prevention strategies in post-secondary institutions.

Some approaches focus on individuals by aiming to change their perceptions about norms, to change their alcohol expectancies, or to increase their self-efficacy and refusal skills. Other approaches focus on changing or regulating the environment in which students binge drink, largely through policy or legislation.

Most college and university campuses in the United States have some form of alcohol use prevention, intervention, or education program (McNally & Palfai, 2001). In a recent survey of U.S. college administrators, Wechsler, Seibring, Liu, and Ahl (2004) found the most popular actions schools were taking to reduce heavy episodic drinking included

- providing counselling and treatment services for students with abuse problems (90%)
- conducting alcohol education targeted to freshmen (84%)
- providing alcohol-free residences (81%)
- employing a substance abuse official (81%)
- restricting alcohol use at home athletic events (80%)
- conducting alcohol education targeted toward fraternity or sorority members (72%) or athletes (69%)

Some studies have shown little or no impact on heavy episodic drinking rates despite the existence of these programs (Wechsler & Isaac, 1992; Wolburg, 2001). Some researchers are especially critical of the poor results of these prevention efforts. Wechsler, Lee, Kuo, et al. (2002) reported there was no significant change in heavy episodic drinking rates among a national sample of U.S. college students since the early 1990s, when significant efforts to combat the problem began. This was despite the fact that more students reported being exposed to educational materials their schools provided about the risks and consequences of drinking, as well as being apprised of their school's rules regarding alcohol, the penalties for noncompliance, where they could get help for alcohol-related problems, and the dangers of alcohol overdose.

Others are more optimistic about the impact of prevention programs, and question the methods of researchers who claim prevention efforts have had no effect. Ziemelis, Bucknam, and Elfessi (2002) found that U.S. colleges with effective prevention programs did see a decrease in heavy episodic drinking rates.

Approaches focused on the individual

Several approaches discussed in the literature focus on creating change in individuals. These approaches include traditional education and information campaigns; altering individuals' perceptions of social norms; changing individuals' positive or negative expectancies regarding alcohol; and increasing individuals' skills to help them choose healthier behaviours.

Education and information campaigns

One approach that has been found to be ineffective is the traditional education or information campaign that provides general information about alcohol and the risks or consequences of drinking (Brower, Golde, & Allen, 2003; Hope, 2004; Schulenberg et al., 2001; Vicary & Karshin, 2002; Walters & Bennett, 2000; Wechsler et al., 2000; Yanovitzky & Stryker, 2001). While these approaches have been found to raise awareness about alcohol issues, researchers note that changes in attitude and knowledge about alcohol are not necessarily accompanied by actual decreases in drinking (Walters, Bennett, & Noto, 2000).

Walters, Bennett and Noto (2000) found that although general information about alcohol was ineffective in changing behaviours, personalized feedback did affect individuals' binge drinking rates at follow-up. Other researchers also suggest that education and awareness campaigns, while ineffective on their own or as a lead strategy, may still be an important supporting strategy to other prevention initiatives (DeJong & Hingson, 1998; Hope, 2004). For example, Ziemelis, Bucknam, and Elfessi (2002) found that educational and informational processes that avoided coercive approaches, and encouraged egalitarian and interactive rather than top-down or unilateral communication among professionals and students, were successful components of strategies that decreased heavy episodic drinking rates.

Social norms campaigns

Social norms approaches have also received a lot of attention in recent years. Social norms approaches start from the assumption that most students overestimate how much alcohol their peers are consuming, and that the "perception of the normativeness of a behaviour in a peer group may impact behaviour more than the actual prevalence of the behaviour" (Page, Scanlan, & Gilbert, 1999, p. 98). Social norms education or marketing campaigns aim to dispel inaccurate perceptions students may have about drinking, in the hope that fewer students will engage in high-risk drinking (DeJong, 2001; Vicary & Karshin, 2002). Social norms marketing of this type does not change the environment, but reduces misperceptions about the environment (Brower et al., 2003).

Relationship between perceptions of social norms and heavy episodic drinking – Numerous studies have found an association between perceptions of levels of heavy episodic drinking and student behaviour. D'Amico et al.

(2001) found that "lower levels of perceived student drinking appeared to be a protective factor for onset of binge drinking" among high school students (p. 347). Maney et al. (2002) found that "when respondents thought their friends consumed greater quantities of alcohol, the respondents' total quantity and frequency of alcohol use was significantly higher" (p. 229).

Other studies have qualified the relationship between perceived norms and an individual's behaviour. Students' drinking behaviour was found to align more with that of their immediate social group than with that of the overall student population (Wechsler et al., 2003); furthermore, "the effects of group norms on binge drinking intentions were stronger for participants who strongly identified with the in-group" (Johnston & White, 2003, p. 74). Wechsler and Kuo (2000) have also stated that perceptions of close friends' (or a close social group's) drinking norms are a stronger influence than norms of students in general. In a study on substance-use behaviours of gay, lesbian and bisexual (GLB) college students, Eisenberg and Wechsler (2003) found that school-wide prevalence of heavy episodic drinking did not have an association with substance use behaviours of students with same-sex experience, suggesting that "behavioural norms set by a predominantly straight student body may not be particularly salient among GLB students on campus" (p. 1920).

Other studies have specified that binge drinkers are most likely to have exaggerated perceptions of drinking norms (Page et al., 1999). In fact, Wechsler and Kuo (2000) found that 47% of students underestimated the binge drinking rate at their school, 29% overestimated it, 13% were accurate within 10 per cent, and 12% said they did not know. Those students who overestimated the binge drinking rate for their campus were more likely to be binge drinkers.

Evidence for and against the social norms approach – A handful of studies suggest that the social norms approach may be effective. Haines and Spear (1996), who evaluated a public information campaign designed to correct perceptions of norms on a U.S. campus, noted a decrease in the proportion of students who perceived heavy episodic drinking as the norm, as well as a reduction in self-reported heavy episodic drinking over the five-year study (from 43% to 34.2%). Glider, Midyett, Mills-Novoa, Johannessen, and Collins (2001), who evaluated a social norms marketing media campaign on a large southwestern university campus, reported positive preliminary results of an overall 29.2% decrease in binge drinking rates over a three-year period. Agostinelli, Brown, and Miller (1995) also found that normative feedback was effective in reducing binge drinking rates.

These findings have led some researchers to endorse this approach (DeJong, 2001; Walters et al., 2000; Yanovitzky & Stryker, 2001), but others are more skeptical about whether the evidence is sufficient to conclude that social norms approaches are effective. Werch et al. (2000) and Wechsler et al. (2003) have identified several methodological weaknesses of studies on

the effect of social norms, such as small sample sizes, convenience sampling, sample attrition, low response rates, failure to control for demographic differences in pre-test group and post-test group, lack of comparison group, experimenter expectancy effects, and controlling for the effect of other activities on campus that occurred at the same time as the social norm campaign.

Werch et al. (2000) found that "normative information may have limited effects on modifying the drinking behaviours of college students" (p. 90) in a study considered by Wechsler et al. (2003) to have used more sound methods. Wechsler et al. (2003) also conducted their own study of colleges that were using social norms campaigns and "did not detect a decrease in alcohol consumption at schools that implemented a social norms marketing program on measures of the quantity, frequency, or volume of student alcohol use, or in measures of drunkenness and heavy episodic drinking" (p. 491).[3,4]

Wechsler et al. (2003) are critical of social norms approaches, suggesting that they are attractive to the alcohol industry because they "downplay the level of drinking on campus and do not emphasize the negative consequences of heavy alcohol consumption or suggest that drinkers could harm themselves or others" (p. 485). According to Wechsler, Seibring, Liu, and Ahl (2004), schools conducting social norms marketing campaigns were less likely "to provide alcohol-free campuses, to ban alcohol from all dorms, and to restrict alcohol at college-sponsored, on campus events" (p. 162). Wechsler et al. (2003) suggest that social norm approaches

> provide a positive tone and a palatable "solution" to an otherwise frustrating and chronic problem. They may also be alternatives to (or distractions from) more difficult to implement but potentially more effective actions such as tougher penalties for alcohol-associated violations of standards of conduct, limiting students' access to alcohol, or controlling marketing practices of the alcohol industry. (p. 492)

Recommendations regarding social norms approaches – Those who are not convinced of the effectiveness of social norm approaches suggest that these approaches may be more effective if targeted at students who are already binge drinking, but caution against using this approach for

[3] The schools employing social norms marketing programs in this study had higher rates of drinking at baseline.

[4] In a July 2003 news release from Hobart and William Smith Colleges, H. Wesley Perkins criticized Henry Wechsler's work that argues social norms approaches are ineffective. Perkins is currently the Principal Researcher of the Canadian Centre for Social Norms Research and Professor of Sociology at Hobart and William Smith Colleges. He said Wechsler provided a "biased and limited" review of the literature in his study, which ignored some work that found social norms approaches to be effective. As well, Perkins said that Wechsler's survey did not define social norms and thus did not distinguish between the quality and intensity of social norm campaigns. Some traditional educational interventions may even have been labeled as social norm campaigns in Wechsler's survey, according to Perkins, making Wechsler's finding that social norms campaigns had little effect all the more likely, given the well-known ineffectiveness of educational interventions. As well, Perkins viewed the number of schools that reported using a social norms approach as inflated, which could also be a result of the survey method.

the general student population. There are concerns that a social norms approach may actually have negative outcomes for students who do not drink or who binge drink only occasionally (Wechsler et al., 2003; Wechsler & Kuo, 2000, Werch et al., 2000).

Social norms in the news, August 2004 – Recent articles in the Edmonton Journal (Johnsrude, 2004) and Lethbridge Herald (Newswire, 2004) highlighted research done by the Canadian Centre for Social Norms Research, a branch of the Student Life Education Company that is funded by the Brewers Association of Canada. In a survey of 5,000 students at 10 universities and colleges across Canada, 63% of students said they drank alcohol twice a month or less frequently. Of those, 64% said they drank four drinks or fewer at any one time. Further information on the 37% of respondents who said they drank more than twice per month, or the 36% who said they consume more than four drinks at parties or bars, was not reported.

The survey reported that 80% of students thought their peers drank seven or more drinks at least once a week, which is cited as evidence of the need for a social norms campaign to correct students' overestimation of drinking rates. The results of the survey are the basis of a social norms campaign that will be conducted on various campuses across Canada, including the University of Alberta. Students will be surveyed again in October to see if the campaign has changed their attitudes (Johnsrude, 2004).

The survey's findings were viewed with skepticism by some, including Steve Ferzacca, an anthropology professor at the University of Lethbridge who has been conducting his own research on student drinking. Figures from his research do not support the same conclusions. Ferzacca has stated that the Student Life Education Company's research is "research with an agenda" (Newswire, 2004).

Changing individuals' alcohol expectancies

Another individual-focused approach to reduce heavy episodic drinking is changing a person's alcohol expectancies. Alcohol expectancies are "subjective, anticipated beliefs about the positive or negative effects of alcohol" (McNally & Palfai, 2001, p. 722). Negative alcohol expectancies include behavioural impairment, physical after-effects, and depressant effects. Positive alcohol expectancies include social facilitation, sexual enhancement, and tension reduction.

According to one study, students drank more in the week following a positive experience with drinking, but did not drink less in the week following a negative experience with drinking (Maggs, 1997, as cited in Schulenberg et al., 2001). Another study reported that negative *emotional* expectancies (such as feeling guilty, ashamed or depressed) contributed to respondents' readiness to change; the researchers concluded that strategies to enhance negative emotional expectancies could expedite the change process. Negative behavioural, physical or social expectancies did not

have the same effect (McNally & Palfai, 2001). These authors suggested that "reducing positive expectancies may be a more appropriate goal for preventing problem drinking, whereas enhancing negative expectancies may be a more appropriate goal for changing problem drinking" (p. 729).

Apart from alcohol expectancies research, other researchers note the positive attributes students assign to alcohol use, and caution that those wishing to reduce heavy episodic drinking need to acknowledge the social role alcohol plays in students' lives, and to offer alternative ways to fill that role (Broadbear, O'Toole, & Angermeier-Howard, 2000; Lederman et al., 2003; Wolburg, 2001).

Developing individuals' moderate drinking skills

A skills-based approach assumes individuals lack the skills to drink moderately, and thus encourages self-control, responsible decision-making, and utilization of coping methods other than drinking (Walters & Bennett, 2000).

In a review of the literature on empirically evaluated prevention programs, skills-based approaches were found to have produced modest reductions in drinking behaviour (Walters & Bennett, 2000). In one study on the impact of a program called "LifeSkills Training" on minority students in inner-city middle schools in New York, Botvin, Griffin, Diaz, and Ifill-Williams (2001) found "measurable changes in binge drinking at the 1- and 2-year follow-up assessments" (p. 363). The proportion of binge drinkers in the intervention group-which received more than 25 sessions over two years on alcohol and drug resistance skills, norms against drinking and other drug use, and the development of important personal and social skills-was 50% lower than in the control group.

Personalized feedback and brief interventions

Some studies on the effectiveness of brief interventions like motivational interviews have shown that these approaches had a positive effect on heavy episodic drinking rates, suggesting an effective alternative to more intensive programs. In fact, some studies have shown that personalized feedback had a positive effect on heavy episodic drinking rates even when delivered by mail.

Marlatt and Baer (1997) randomly assigned a group of high-risk drinkers to participate in a feedback interview after monitoring their drinking for a two-week period. Participants received feedback on their drinking patterns (including how it compared with college averages), the risks involved in their drinking style, and their beliefs about alcohol. At the two year follow-up, those who received the interview reported less drinking than those in the control group: "Although all students on average reported reduced drinking over time, significantly greater reductions were continually reported by those given the brief advice intervention" (p. 255).

Gintner and Choate (2003) have recommended motivational interviewing for treatment of binge drinkers because many of them may be in the early stages of change (precontemplation or contemplation), at which time interventions focused on motivational issues and problem recognition are most helpful. Gintner and Choate found that 67% of college student binge drinkers were in the precontemplation stage, 20% were in the contemplation stage, and 13% were in the action stage.

There is some evidence to suggest that program duration is unrelated to outcome. In one study, a "single session of professional advice showed results comparable to that of the more extensive prevention programs" such as a six-week classroom or six-lesson correspondence course (Marlatt & Baer, 1997, p. 250; see also Walters & Bennett, 2000).

Agostinelli et al. (1995), cited in Walters, Bennett, and Noto (2000), found that even feedback mailed to participants with no face-to-face meeting was effective. Walters, Bennett, and Noto (2000) found mailed feedback to be the most effective intervention (compared with a two-hour information session, the information session and mailed feedback, or no intervention at all) at the six-week follow-up. They suggested that group settings of heavy drinkers may actually normalize heavy drinking, so individually administered feedback may be more effective at changing students' perceptions of norms.

To make these types of interventions most effective, researchers recommend increasing screening and outreach programs to identify students who could benefit from alcohol-related services, and to ensure timely referral and treatment of people with alcohol-related problems (DeJong & Hingson, 1998; Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002).

Risk perception model

Wolburg (2001) has developed an integrated risk perception model from her qualitative research on students' perceptions of the risks of heavy episodic drinking, and from previous research on risk (see Appendix II). The model incorporates several elements, including perceptions of

- severity of risk
- susceptibility to the risk
- response efficacy (that the action or response would be successful in reducing risks)
- self-efficacy (that one has the ability to successfully execute the desired behaviour)

Wolburg (2001) found that students downplayed the severity of the risks of heavy episodic drinking. Although they identified over a dozen risks associated with heavy episodic drinking, they saw consequences like

getting sick or having a hangover as minimal, and felt that no one disapproves of the consequences. They also felt they were not susceptible or vulnerable to the risks. By and large, they did not do anything to manage the risk; they just "take their chances." Some spoke about choosing a "babysitter," "party monitor," or "designated driver" for an evening. Most of the risk management responses they talked about did not involve self-efficacy (for example, just taking their chances), or placed all responsibility on the designated babysitter (Wolburg, 2001).

Wolburg's (2001) model suggests that there is a very small audience for whom messages warning about the risks of heavy episodic drinking will be effective. That is, the only people who will respond to these messages are those who perceive the risks as severe, believe they are susceptible to the risks, see the benefits of changing their behaviour as outweighing the costs, feel the response would be effective, and feel they are able to change their behaviour.

Wolburg (2001) suggests that in other cases, efficacy messages that emphasize the effectiveness of the response and the ability of the individual to carry out the response would be more effective than messages that warn about the risks. One such case is when the individual's perception of severity and susceptibility are high, but the costs of changing their behaviour are seen to outweigh the benefits. This combination of circumstances may trigger a fear response, which may lead to denial or even more excessive drinking and risky behaviour. Another case is when an individual perceives the severity and susceptibility of the risks as high, and sees the benefits of changing the behaviour as outweighing the costs, but feels the response would not be effective or does not believe that he or she is able to carry out the change.

In cases where perceptions of risk severity and susceptibility are low, Wolburg (2001) suggests that a social norms approach may be useful. Wolburg suggests that successful campaigns need to address all elements of the risk model.

Approaches focused on the environment

Environmental approaches are another way to address the issue of heavy episodic drinking. These approaches aim to change the "physical, social, economic, and legal environments" that shape students' drinking behaviour (Maney et al., 2002, p. 226). These environmental management, or public health, approaches may include institutional, community or public policy change (DeJong et al., 1998; Maney et al., 2002). Environmental management strives to modify the actual social norms of drinking, not just the perceptions of those norms (Norman, Bennett, & Lewis, 1998).

Several features of the campus environment make it conducive to heavy episodic drinking. Behavioural norms and attitudes, institutional policies and practices, and the very culture of campus life may promote this drinking behaviour (Bishop, 2000; Walters et al., 2000). Kuo, Wechsler, Greenberg

and Lee (2003) found that campuses with "wet" alcohol environments-including "lower sale prices, more promotions, and alcohol advertising at both on- and off-premise establishments"-had higher binge drinking rates (p. 209). Ziemelis, Bucknam, and Elfessi (2002) found campus regulatory and physical change efforts to be key variables in prevention efforts. These efforts include sponsoring alcohol-free parties, dances, socials, and coffee houses, providing alcohol-free residence halls and recreational facilities for students, disseminating and enforcing alcohol policies, and providing mandatory alcohol and other drug classes as part of interventions.

Most environmental approaches fall under policy and regulation, either on campus or off. In general, policy approaches are more successful when they are well publicized and consistently enforced (DeJong & Hingson, 1998). The effectiveness of various environmental management approaches is discussed below.

On-campus strategies

Use media or public health campaigns

Media campaigns or public health campaigns can be used to create awareness of an issue like heavy episodic drinking, and of related policies. They can also be used to create low tolerance for the behaviour. However, Yanovitzky and Stryker (2001) found that although media campaigns may be successful in raising awareness of an issue, they are less often successful in changing behaviour. As well, media campaigns often struggle to secure sufficient exposure, to target different subpopulations with the message, and to effectively compete with advertising in the mainstream media (Yanovitzky & Stryker, 2001). Like education approaches, media campaigns may not be effective alone but can be an important part of a multi-faceted campaign to raise awareness and set a tone on campus (Hope, 2004).

Provide substance-free housing

Many researchers recommend that campuses provide at least some substance-free housing for students. Substance-free housing may provide students with protection from second-hand effects, and may also work as a protective factor preventing those who did not binge drink in high school from binge drinking in college (Wechsler, Lee, Kuo, et al., 2002; see also Weitzman, Nelson, Lee and Wechsler, 2004).

Support substance-free events on campus

Another area of on-campus policy is for campuses to sponsor various alcohol-free events on campus (Brower et al., 2003; Vicary & Karshin, 2002; Weitzman et al., 2004). It is important that these events are available during the hours that students usually drink (especially 12 a.m.-3 a.m.) (Bishop, 2000). Extending the hours of libraries and recreational facilities may also be effective (U.S. Department of Education Safe and Drug-Free Schools Program, 2002).

While many researchers recommend that campuses sponsor substance-free events, Correia, Carey, Simons, and Borsari (2003) caution that these events may be more successful with non-heavy drinkers. In their study on the reinforcement (or pleasure) derived from substance-free experiences, the authors found that "students who engaged in binge drinking two or more times during the past month derived less reinforcement from certain types of substance-free experiences than students in the comparison group" (p. 367). They suggest that skill deficits may "limit the ability of some individuals to derive reinforcement from certain types of substance-free activities" (p. 367).

Regulate alcohol advertising and sponsorship on campus

Another on-campus strategy is to regulate alcohol advertising and sponsorship, particularly for athletic events (Jernigan, 2001; Kuo et al., 2003; U.S. Department of Education Safe and Drug-Free Schools Program, 2002; World Health Organization, 2004). University and college campuses are a prime target for alcohol industry advertising. Pedersen (2002) reports that the alcohol industry spends millions on advertising targeting the college audience of high consumers. Approximately 35% of all advertising revenues for college newspaper comes from alcohol ads. College newspapers are an inexpensive marketing venue for the alcohol industry: one study suggests that a $2 million ad campaign for a college newspaper would cost $20 million in a commercial newspaper (Pedersen, 2002). Pedersen adds that "the pervasive pattern of alcohol promotions found in many college newspaper serves to normalize and support the perception of widespread alcohol use" (p. 36).

Alcohol advertising on campus may be particularly effective in reaching students who binge drink. In her study on the influence of alcohol advertising on binge drinking students versus non-binge drinking students, Pedersen (2002) found that "binge drinkers perceived significantly more influence of alcohol advertising on their drinking behaviours than did non-binge drinkers" (p. 31). Drink specials influenced how many nights of the week they went out, what they ordered when they went out, how much they drank when they went out, and which bar or club they visited. In a review of the literature prior to Pedersen's study, however, Grube and Nygaard (2001) found little empirical support for advertising restrictions as effective strategies for preventing drinking or drinking problems among young people.

Build social capital on campus

Other studies have found that building social capital—defined as the patterns of civic engagement, trust and mutual obligation among persons (Weitzman & Kawachi, 2000)—can be an effective way of reducing heavy episodic drinking rates on campuses, apart from any direct focus on alcohol policies.

Weitzman and Kawachi (2000) looked at social capital on campus as measured by volunteerism and found that "students at campuses with high levels of social capital were 26% less likely to binge drink than were their

peers at campuses with low levels of social capital" (p. 1937). The authors suggest building social capital as an alternative to norm-shifting and supply-reducing approaches to reducing heavy episodic drinking.

Similarly, Brower, Golde, and Allen (2003) studied the effect of residential learning communities on heavy episodic drinking rates. Residential learning communities (RLC) are where students with similar interests or goals are housed together and attend small classes or sections that are set aside for them. They may also have special programming like guest speakers and field trips. An example of an RLC is Women in Science and Engineering (WISE). The RLCs included in this study had no special programming on alcohol use (Brower et al., 2003). The researchers found that RLC students were less likely to drink and less likely to binge drink than other students (38% of RLC students binge drank once or more in the past 2 weeks, compared with 57% of non-RLC students) (Brower et al., 2003). The RLC and non-RLC students compared in this study were similar in many respects, including involvement in high school activities and drinking in high school.

Enhance academic expectations

Some researchers also suggest enhancing academic expectations to deter heavy episodic drinking. For example, scheduling classes on Friday creates the expectation that students will not be out drinking on Thursday night (Brower et al., 2003; U.S. Department of Education Safe and Drug-Free Schools Program, 2002).

Enforce alcohol policies

Other researchers note the importance of making students aware of campus alcohol policies and enforcing these policies consistently. The U.S. Department of Education recommends disciplining repeat offenders and those who engage in unacceptable behaviour associated with substance use, and notifying parents when students engage in serious or repeated violations of policies and laws related to alcohol and other drugs (U.S. Department of Education Safe and Drug-Free Schools Program, 2002).

Prohibit alcohol on campus

Although several studies recommend providing alcohol-free residences on campus, few propose comprehensive prohibition policies. Lewis (2001) recommends focusing on the adverse behaviours of heavy episodic drinking as opposed to use of alcohol itself, and suggests that campuses should provide opportunities for students to learn to drink responsibly and in moderation, rather than banning drinking altogether.

Odo, McQuiller, and Stretesky (1999) conducted a survey on a campus one month after a policy was implemented to prohibit alcohol in all residence halls including Greek houses. They found that students living in areas affected by the alcohol prohibition policy were less likely to consume alcohol than students living in areas (on campus or off) where they were

permitted to drink. However, the policy did not seem to have any impact on rates of heavy episodic drinking, leading the authors to suggest that the prohibition policy reduced casual drinking but not problem drinking.

Off-campus strategies

Regulate alcohol prices

Increasing the price of alcohol is one suggestion for how student drinking can be controlled (Grube & Nygaard, 2001; Jernigan, 2001; Wechsler, Lee, Kuo, et al., 2002; Weitzman, Folkman, Folkman, & Wechsler, 2003; World Health Organization, 2004). The price of alcohol has been found to correlate with alcohol consumption, especially for young people (Brower et al., 2003; Kuo et al., 2003). Stockwell and Single (1999) note that increasing the price of alcohol generally does not have a lot of public support.

SAMHSA has reviewed the effectiveness of raising taxes and prices as a strategy to prevent problems related to alcohol availability. They found strong evidence[5] that increases in alcohol taxes result in a moderate decrease in alcohol consumption, and suggestive but insufficient evidence that increases in alcohol taxes have a strong effect on drinking initiation among youngsters (Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Prevention (SAMHSA/CSAP), 1999).

Require warning labels on beverages

Requiring warning labels on alcoholic beverages is another potential strategy to reduce heavy episodic drinking. Creyer, Kozup, and Burton (2002) recommend warning labels that identify alcohol as a drug, arguing that this label "is more likely to create cognitive links to more negative concepts (e.g., addiction, hard drugs like cocaine and amphetamines for which risks are more well accepted) that influence risk and consumption perceptions" (p. 197). They also suggest that labels should be targeted at the binge drinking population. In a review of the literature, Grube and Nygaard (2001) found little empirical support for warning labels as effective strategies for preventing drinking or drinking problems among young people. The World Health Organization (2004) concluded that labels have little or no effect on risk perception or drinking behaviour among people who notice the label.

Raise minimum drinking age

Raising the minimum drinking age (MDA) is also suggested as a strategy to reduce heavy episodic drinking (Grube & Nygaard, 2001; Jernigan, 2001; Wechsler, Lee, Nelson, et al., 2002; World Health Organization 2004). In their review of ways to reduce alcohol availability to youth, SAMHSA found strong evidence[6] that increasing the minimum drinking age results

[5] See Appendix III for the criteria SAMHSA used for each level of evidence.
[6] See Appendix III for the criteria SAMHSA used for each level of evidence.

in a decrease in traffic casualties, and medium evidence that increasing the MDA results in a decrease in consumption of alcohol and consequent alcohol problems other than traffic casualties (SAMHSA/CSAP, 1999).

AADAC's review of the literature reported that

> overall, research is not conclusive as to the effectiveness of raising the LDA [legal drinking age] in reducing alcohol-related problems and alcohol consumption among youth. The literature identifies both benefits and the potential for negative consequences from raising the LDA. Research also shows that there are factors other than legislation that influence youth drinking behaviours. (Nickerson, 2001, p. iii)

Restrict hours of service and days of sale

Another strategy for reducing heavy episodic drinking is to restrict the hours of service and days of sale for alcohol outlets (Wechsler, Lee, Kuo, et al., 2002; World Health Organization, 2004). SAMHSA found medium evidence[7] that expanding hours or days of alcohol sales increases rates of alcohol consumption and alcohol-related problems (SAMHSA/CSAP, 1999).

Regulate activities of bars

Other researchers suggest influencing the activities and environment of bars and clubs to discourage heavy episodic drinking. For example, some researchers suggest that bars should be encouraged to offer activities other than simply consuming alcohol; such activities could include games like pool, because drinking interferes with one's ability to shoot pool (Norman et al., 1998; Brower et al., 2003). Norman, Bennett, and Lewis (1998) also suggest encouraging a mixed clientele of men and women to reduce social pressure to binge drink. However, recent observations that heavy episodic drinking rates may be increasing among women raise some questions about the validity of this suggestion.

Regulate density of alcohol outlets

Regulating the density of alcohol outlets around campuses is another strategy to reduce heavy episodic drinking rates among young adults (Wechsler, Lee, Hall, Wagenaar, & Lee, 2002). SAMHSA found medium evidence[8] that an increase in the number of outlets per capita increases rates of alcohol consumption and alcohol-related problems (SAMHSA/CSAP, 1999). Weitzman, Folkman, Folkman, and Wechsler (2003) found a significant correlation between outlet density and heavy drinking for all drinkers.

[7] See Appendix III for the criteria SAMHSA used for each level of evidence.
[8] See Appendix III for the criteria SAMHSA used for each level of evidence.

Focus on server responsibility

Some researchers also recommend server training and emphasizing responsible server practices (Wechsler, Lee, Hall, et al., 2002; Weitzman et al., 2004). SAMHSA's review of responsible beverage service found strong evidence[9] that server training and policy interventions are effective in curbing illegal sales to intoxicated and underage individuals when these interventions are combined with enforcement activities, medium evidence that server training and policy interventions are effective in improving some forms of server behaviour (at least in the short term), and medium evidence that server training can lead to more responsible service practices and management policies (SAMHSA/CSAP, 1999). Grube and Nygaard (2001), however, found little empirical support for responsible beverage service.

Other considerations

Key players in prevention efforts

Students

Several researchers recommend involving post-secondary students in the development and implementation of prevention policies and programs (Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002; Ziemelis et al., 2002). Most students were found to support strict enforcement of existing rules and cracking down on underage drinkers (Wechsler et al., 2000). Mobilizing abstainers and moderate drinkers around issues of second-hand effects of heavy episodic drinking is a suggested strategy, similar to what has been done for issues like second-hand smoke and drunk driving (Wechsler et al., 2000).

Heavy drinkers are more likely to be opposed to policies that restrict or inhibit drinking on campus, but Wechsler, Nelson, and Weitzman (2000) suggest these students are a "vocal, highly visible, but relatively small minority" (p. 41). However, these students are also the target of prevention efforts, so the effectiveness of prevention strategies should be considered with them in mind.

Community

The binge drinking environment encompasses the community surrounding the campus, as well as the campus itself. It is therefore important to work with the community to target binge drinking, because a solely on-campus strategy may simply transfer problems off campus. SAMHSA found strong evidence[10] that community-based prevention activities can result in decreases in alcohol consumption (SAMHSA/CSAP, 1999). Other researchers also strongly support community involvement in prevention

[9] See Appendix III for the criteria SAMHSA used for each level of evidence.
[10] See Appendix III for the criteria SAMHSA used for each level of evidence.

efforts (Bishop, 2000; DeJong & Hingson, 1998; Jernigan, 2001; Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, 2002; Wechsler, Lee, Kuo, et al., 2002).

Administrators and faculty

In addition to involving students and the surrounding community, prevention efforts will be most successful if they involve faculty and have strong backing from campus administrators in high-level positions (Bishop, 2000; Wechsler et al., 2000).

Alcohol industry

Although the alcohol industry is often a source of funding, some researchers are critical of the involvement of this industry in prevention initiatives (Wechsler et al., 2003). BeerSoaksAmerica.org (Alcohol Policies Project, 2004), a web-based campaign linked to the Alcohol Policies Project of the Center for Science in the Public Interest in the United States, suggests brewers' and beer wholesalers' "responsibility programs" have been more effective as public relations tools than as serious prevention efforts. The group argues that industry-sponsored programs and slogans

- assume the fact of drinking
- place the blame for alcohol problems solely on individuals
- never define "safe" consumption
- focus on harm reduction (e.g., designated drivers) rather than discouraging heavy use
- fail to offer any warning about alcohol's risks
- fail to identify high-risk groups who should not drink at all

Targeted versus universal approaches

Given the diversity of subpopulations within university and college populations and the range of heavy episodic drinking rates among these subpopulations, strategies to decrease heavy episodic drinking may work best if targeted at high-risk populations such as members of fraternities and sororities, first-year students, and athletes (Wechsler, Lee, Kuo, et al., 2002). If a universal strategy is used that will affect all students, DeJong (2001) suggests telling students truthfully that "certain policies must be imposed to deal with irresponsible students whose problem drinking puts the entire community at risk" rather than telling them that all student drinkers are part of the problem (p. 295).

Fraternities and sororities

There are several initiatives already underway targeting fraternities and sororities. BACCHUS (Boosting Alcohol Consciousness Concerning the Health of University Students) and GAMMA (Greeks Advocating

the Mature Management of Alcohol) are two international Greek organizations focused on addressing problems with alcohol consumption on campus, specifically in fraternities and sororities (Vicary & Karshin, 2002; Wechsler & Nelson, 2001).

Some universities have established "Five Star Accreditation" programs where fraternities and sororities receive an annual rating out of five stars based on how well they embrace the values of scholarship, brotherhood or sisterhood, and community service, and on how well they discourage members from violating the campus code of conduct. Organizations that receive a low rating may be prohibited from sponsoring social events, recruiting new members, or participating in some traditional campus-wide Greek-life events (Bishop, 2000).

In mid-2003, the Theta Chi fraternity implemented an umbrella ban on alcohol in its 136 chapters across the U.S. and Canada. Chapters can be exempted from the ban if the brothers "maintain grades equal to or above their college's all-men's average, are up to date on financial obligations, and have no risk-management violations" (Harris, 2004). The University of Alberta's Farm House fraternity has been alcohol-free from its inception.

Harm reduction approaches

Harm reduction approaches to heavy episodic drinking focus on preventing harmful outcomes of the behaviour rather than preventing heavy episodic drinking itself. Youth and young adults are populations for whom harm reduction approaches are considered to be effective: "programs that recognize the reality of adolescent substance use, and that focus on reducing the potential for related harm, are more likely to be successful than programs that focus on abstinence alone" (Centre for Addiction and Mental Health, 1999, p. 1). Harm reduction may be appropriate in rural communities because there tends to be more acceptance of young people's drinking in these communities (Kerr, 2001). Stockwell and Single (1999) suggest that harm reduction approaches may also meet with less public resistance than consumption reduction approaches (like raising prices, reducing hours of sale, reducing density of outlets, etc.).

However, some researchers suggest that harm reduction efforts may actually promote heavy alcohol consumption. Focus group interviews with college students revealed that they saw harm reduction efforts as providing opportunities for heavy episodic drinking: "harm reduction efforts like designated drivers, night ride programs, and party monitors are viewed by students as practices that support binge drinking and alleviate personal responsibility and accountability associated with this behaviour" (Broadbear et al., 2000, p. 95). These authors suggest that while harm reduction efforts like designated driver programs may have reduced alcohol-related motor vehicle crashes among young people, they also may have had unintended consequences, like encouraging heavy episodic drinking (Broadbear et al., 2000).

Conclusions

There are many options to choose from when designing a strategy to prevent and reduce heavy episodic drinking among youth and young adults. Despite the fact that some approaches or programs have yet to be rigorously evaluated and that research has focused almost solely on post-secondary populations, some conclusions can be drawn to guide efforts to design a comprehensive and effective strategy.

1. Use a multi-faceted approach – The literature suggests that no single solution will reduce heavy episodic drinking rates. Rather, comprehensive approaches that include multiple strategies appear to be most effective. Many approaches that are not effective on their own are more promising when reinforced by other strategies.

2. Target high-risk groups – Prevention and reduction efforts may be most efficient if targeted at high-risk groups (for example, post-secondary students in general, and fraternity or sorority members and first year students within the post-secondary population). Although women are not as likely as men to be heavy episodic drinkers, they are particularly susceptible to some negative consequences of heavy episodic drinking and thus may warrant special attention; likewise for rural youth. Aboriginal youth are also an important population, given the high rates of substance use among this group.

3. Use educational approaches as supportive strategies – Educational programs are not effective as lone strategies but may be an important supporting strategy in a comprehensive approach to reducing heavy episodic drinking. Educational components should avoid coercive approaches and encourage egalitarian and interactive rather than top-down or unilateral communication among professionals and students (Ziemelis et al., 2002).

4. Screen and use brief interventions – Post-secondary institutions should be supported in screening to identify frequent heavy episodic drinkers. Motivational interviews are a promising strategy for treatment; interviews should provide students with feedback on their drinking compared with campus norms, should address alcohol expectancies, and should help students develop their refusal skills. Interventions do not need to be intensive: single interactions or even mailed feedback have been effective in some cases.

5. Change the environment in which heavy episodic drinking occurs – Several environmental approaches may be effective in reducing heavy episodic drinking. These approaches attempt to alter social norms regarding heavy episodic drinking by changing the environment in which this behaviour occurs.

On campus

Post-secondary institutions can be supported to

- provide alcohol-free residence halls
- provide alcohol-free events on campus by sponsoring alcohol-free

parties, dances, and coffee houses, and by keeping recreational facilities and libraries open later (These events may be most effective with non-heavy drinkers.)

- build social capital on campus
- encourage institutions to enhance academic expectations (for example, by offering classes on Fridays)
- publicize and enforce alcohol policy
- eliminate alcohol industry support for athletics programs
- restrict alcohol promotions and advertising on campus and in campus publications, especially promotions or advertisements that feature low-cost drinks

Off-campus

Post-secondary institutions can be supported to work with the broader community in changing public policy on how alcohol is made available to students, including regulating the

- price of alcohol
- hours of operation for bars and clubs
- advertising and promotions offered by bars and clubs, particularly those featuring drink specials
- bar and club setting (e.g., promoting activities such as pool which require skill and discourage excessive drinking)
- rules for server responsibility

6. Involve students, community, administration and faculty – Prevention efforts should be community-based. They should also involve students in the design and implementation of programs. Efforts will be most successful if they have strong support from top administration and involve faculty as well.

7. Use social norms and harm reduction approaches with caution – Research findings are mixed on the effectiveness of social norms campaigns in preventing and reducing heavy episodic drinking. Social norms campaigns may be most effective if targeted at frequent and heavy binge drinkers, and if used in conjunction with other approaches.

Similarly, there are differing views on the effectiveness of harm reduction approaches. Some researchers say that encouraging responsible alcohol use and discouraging dangerous alcohol use, rather than emphasizing abstinence, is a good approach for the 15- to 29-year-old population. However, there are some concerns that while harm reduction strategies such as encouraging youth to use designated drivers and party monitors may be effective in reducing alcohol-related motor vehicle crashes among young people, these strategies may actually promote heavy alcohol consumption.

References

Adlaf, E. M., & Paglia, A. (2001). *2001 Ontario student drug use survey (OSDUS)*. Toronto, ON: Centre for Addiction and Mental Health.

Agostinelli, G., Brown, J. M., & Miller, M. R. (1995). Effects of normative feedback on consumption among heavy drinking college students. *Journal of Drug Education, 25*(1), 31-40.

Alberta Alcohol and Drug Abuse Commission. (2003). *The Alberta Youth Experience Survey 2002: Summary report*. Edmonton, AB: Author.

Alberta Alcohol and Drug Abuse Commission. (2004). *Windows of opportunity: A statistical profile of substance use among women in their childbearing years in Alberta*. Edmonton, AB: Author.

Alberta Alcohol and Drug Abuse Commission. (in press). *Use and abuse of alcohol among Alberta youth: The Alberta Youth Experience Survey (2002)*. Edmonton, AB: Author.

Alcohol Policies Project. BeerSoaksAmerica.org. Retrieved September 10, 2004, from http://www.beersoaksamerica.org

Baer, J. S., Kivlahan, D. R., & Marlatt, G. A. (1995). High-risk drinking across the transition from high school to college. *Alcoholism: Clinical and Experimental Research, 19*(1), 54-61.

Bishop, J. B. (2000). An environmental approach to combat binge drinking on college campuses. *Journal of College Student Psychotherapy, 15*(1), 15-30.

Blume, A. W., Schmaling, K. B., & Marlatt, A. G. (2003). Predictors of change in binge drinking over a 3-month period. *Addictive Behaviors, 28*(5), 1007-1012.

Botvin, G. J., Griffin, K. W., Diaz, T., & Ifill-Williams, M. (2001). Preventing binge drinking during early adolescence: One- and two- year follow-up of a school-based preventive intervention. *Psychology of Addictive Behaviors, 15*(4), 360-365.

Brits concerned about binge drinking. (2004, July 22). *Join Together Online: Take action against substance abuse and gun violence*. Retrieved January 20, 2005, from http://www.jointogether.org/sa/news/summaries/reader/0,1854,573274,00.html

Broadbear, J. T., O'Toole, T. P., & Angermeier-Howard, L. K. (2000). Focus group interviews with college students about binge drinking. *International Electronic Journal of Health Education, 3*(2), 89-96.

Brower, A. M., Golde, C. M., & Allen, C. (2003). Residential learning communities positively affect college binge drinking. *National Association of Student Personnel Administrators Journal, 40*(3), 132-152.

Centers for Diseases Control. (2004). Youth Risk Behavior Surveillance-United States, 2003. *Morbidity and Mortality Weekly Report, 53*(SS-2).

Centre for Addiction and Mental Health. (1999). *Alcohol and drug prevention programs for youth: What works?* Toronto, ON: Author

Centre for Addiction and Mental Health. (2002a). Overview of binge drinking in Ontario: Part I. *CAMH Population Studies EBulletin*, (15).

Centre for Addiction and Mental Health. (2002b). Overview of binge drinking in Ontario: Part II. *CAMH Population Studies EBulletin*, (16).

Clapp, J. D., Shillington, A. M., & Segars, L. B. (2000). Deconstructing contexts of binge drinking among college students. *American Journal of Drug & Alcohol Abuse, 26*(1), 139-154.

Correia, C. J., Carey, K. B., Simons, J., & Borsari, B. E. (2003). Relationships between binge drinking and substance-free reinforcement in a sample of college students: A preliminary investigation. *Addictive Behaviors, 28*(2), 361-368.

Creyer, E. H., Kozup, J. C., & Burton, S. (2002). An experimental assessment of the effects of two alcoholic beverage health warnings across countries and binge-drinking status. *Journal of Consumer Affairs, 36*(2), 171-202.

D'Amico, E. J., Metrik, J., McCarthy, D. M., Frissell, K. C., Applebaum, M., & Brown, S. A. (2001). Progression into and out of binge drinking among high school students. *Psychology of Addictive Behaviors, 15*(4), 341-349.

DeJong, W. (2001). Finding common ground for effective campus-based prevention. *Psychology of Addictive Behaviors, 15*(4), 292-296.

DeJong, W. (2003). Definitions of binge drinking. *Journal of the American Medical Association, 289*(13), 1635.

DeJong, W., & Hingson, R. (1998). Strategies to reduce driving under the influence of alcohol. *Annual Review of Public Health, 19*, 359-378.

DeJong, W., Vince-Whitman, C., Colthurst, T., Cretella, M., Gilbreath, M., Rosati, M. et al. (1998). *Environmental management: A comprehensive strategy for reducing alcohol and other drug use on college campuses*. Newton, MA: Higher Education Center for Alcohol and Other Drug Prevention.

Drixler, C., Krahn, H., & Wood, R. T. (2001). Teenage drinking and driving in rural Alberta. *Journal of Youth Studies, 4*(1), 63-81.

Eisenberg, M. E., & Wechsler, H. (2003). Social influences on substance-use behaviors of gay, lesbian, and bisexual college students: Findings from a national study. *Social Science & Medicine, 57*, 1913-1923.

Gintner, G. G., & Choate, L. H. (2003). Stage-matched motivational interventions for college student binge drinkers. *Journal of College Counseling, 6*, 99-113.

Glider, P., Midyett, S. J., Mills-Novoa, B., Johannessen, K., & Collins, C. (2001). Challenging the collegiate right of passage: A campus-wide social marketing media campaign to reduce binge drinking. *Journal of Drug Education, 31*, 207-220.

Gliksman, L., Adlaf, E., Demers, A., Newton-Taylor, B., & Schmidt, K. (2000). *Canadian Campus Survey*. Toronto, ON: Centre for Addiction and Mental Health.

Grube, J. W., & Nygaard, P. (2001). Adolescent drinking and alcohol policy. *Contemporary Drug Problems, 28*, 87-131.

Haines, M. P., & Spear, S. F. (1996). Changing the perception of the norm: A strategy to decrease binge drinking among college students. *Journal of American College Health, 24*(3), 134-140.

Harris, M. (2004, July 30). Will dry fly? Move to alcohol-free frat houses hits resistance. *Edmonton Journal*, p. C1.

Health Canada. (1999). *Literature review: Evaluation strategies in Aboriginal substance abuse programs: A discussion*. Ottawa, ON: Author.

Health Canada. (2001a). *Best Practices: Fetal alcohol syndrome/fetal alcohol effects and the effects of other substance use during pregnancy*. Ottawa, ON: Author.

Health Canada. (2001b). *Best Practices: Treatment and rehabilitation for women with substance use problems*. Ottawa, ON: Author.

Health Canada. (2001c). *Best Practices: Treatment and rehabilitation for youth with substance use problems*. Ottawa, ON: Author.

Health Canada. (2001d). *Situational analysis: Fetal alcohol syndrome/fetal alcohol effects and the effects of other substance use during pregnancy*. Ottawa, ON: Author.

Health Canada. (2003). *A statistical profile on the health of First Nations in Canada*. Ottawa, ON: Author.

Hope, A. (2004). Alcohol policy and young people. *The Globe*, (1&2), 15-24.

Jernigan, D. H. (2001). *Global status report: Alcohol and young people*. Geneva, Switzerland: World Health Organization.

Johnsrude, L. (2004, August 31). Animal House image a "myth": Campaign aims to tell university partiers that drinking less is normal. *Edmonton Journal*, p. B3.

Johnston, K. L., & White, K. M. (2003). Binge-drinking: A test of the role of group norms in the theory of planned behaviour. *Psychology & Health, 18*(1), 63-77.

Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2003). *Monitoring the Future: National results on adolescent drug use, Overview of key findings, 2003*. Bethesda, MD: National Institute on Drug Abuse.

Kerr, D. (2001). *Rural prevention for youth ages 15-17: A literature review*. Edmonton, AB: Alberta Alcohol and Drug Abuse Commission.

Kuo, M., Wechsler, H., Greenberg, P., & Lee, H. (2003). The marketing of alcohol to college students: The role of low prices and special promotions. *American Journal of Preventive Medicine, 25*(3), 204-211.

Lederman, L. C., Stewart, L. P., Goodhart, F. W., & Laitman, L. (2003). A case against "binge" as the term of choice: Convincing college students to personalize messages about dangerous drinking. *Journal of Health Communication, 8*(2), 79-91.

Lewis, D. C. (2001). Urging college alcohol and drug policies that target adverse behavior, not use. *Journal of American College Health, 50*, 39-41.

Maney, D. W., Mortensen, S., Powell, M. P., Lozinska-Lee, M., Kennedy, S., & Moore, B. (2002). Alcohol-free alternative activities for university students: Modeling associated drinking behavior. *American Journal of Health Education, 33*(1), 225-233.

Marlatt, G. A., & Baer, J. S. (1997). Harm reduction and alcohol abuse: A brief intervention for college-students binge drinking. In P. G. Erickson (Ed.), *Harm reduction: A new direction for drug policies and programs, Collection of papers drawn from 7 international conferences on harm reduction* (pp. 245-262). Toronto, ON: University of Toronto Press.

McKenzie, D. (Ed.). (1995). *Aboriginal substance use: Research issues, Proceedings of a joint research advisory meeting*. Ottawa, ON: Canadian Centre on Substance Abuse.

McNally, A. M., & Palfai, T. P. (2001). Negative emotional expectancies and readiness to change among college student binge drinkers. *Addictive Behaviors, 26*(5), 721-734.

Naimi, T. S., Lipscomb, L. E., Brewer, R. D., & Gilbert, B. C. (2003). Binge drinking in the preconception period and the risk of unintended pregnancy: Implications for women and their children. *Pediatrics, 111*(5), 1136-1141.

Nanson, J. L. (1997). Binge drinking during pregnancy: Who are the women at risk? *Canadian Medical Association Journal, 156*(6), 807-808.

National Organization on Fetal Alcohol Syndrome. (2004). *Alcohol and pregnancy don't mix: Binge drinking among women ages 18-44 on the rise*. Washington, DC: Author.

Newswire. (2004, August 31). The binge alcohol consumption depicted in movies such as Animal House and Old School does not accurately reflect student drinking patterns, according to a study. *Lethbridge Herald*, p. A1.

Nickerson, C. (2001). *The legal drinking age: A review of the literature*. Edmonton, AB: Alberta Alcohol and Drug Abuse Commission.

Norman, P., Bennett, P., & Lewis, H. (1998). Understanding binge drinking among young people: An application of the theory of planned behaviour. *Health Education Research, 13*(2), 163-169.

Northern Health Information Partnership. (2003). *Northern Ontario child and youth health report*. Sudbury, ON: Author.

Odo, J., McQuiller, L., & Stretesky, P. (1999). An empirical assessment of the impact of RIT's student alcohol policy on drinking and binge drinking behavior. *Journal of Alcohol & Drug Education, 44*(3), 49-67.

Oei, T. P. S., & Morawska, A. (2004). A cognitive model of binge drinking: The influence of alcohol expectancies and drinking refusal self-efficacy. *Addictive Behaviors, 29*(1), 159-179.

Oesterle, S., Hill, K. G., Hawkins, J. D., Guo, J., Catalano, R. F., & Abbott, R. D. (2004). Adolescent heavy episodic drinking trajectories and health in young adulthood. *Journal of Studies on Alcohol, 65*(2), 204-212.

Page, R. M., Scanlan, A., & Gilbert, L. (1999). Relationship of the estimation of binge drinking among college students and personal participation in binge drinking: Implications for health education and promotion. *Journal of Health Education, 30*(2), 98-100.

Pedersen, P. J. (2002). The influence of alcohol advertising on students' drinking behaviors. *National Association of Student Personnel Administrators Journal, 40*(1), 25-38.

Pincock, S. (2003). Binge drinking on rise in U.K. and elsewhere. *Lancet, 362*(9390), 1126-1127.

Roberts, G., McCall, D., Stevens-Lavigne, A., Anderson, J., Paglia, A., Bollenbach, S., et al. (2001). *Preventing substance use problems among young people: A compendium of best practices*. Ottawa, ON: Office of Canada's Drug Strategy, Health Canada.

Rutman, D., Callahan, M., Lundquist, A., Jackson, S., & Field, B. (2000). Substance use and pregnancy: Conceiving women in the policy-making process. Ottawa, ON: Status of Women Canada.

Schulenberg, J., Maggs, J. L., Long, S. W., Sher, K. J., Gotham, H. J., Baer, J. S., et al. (2001). The problem of college drinking: Insights from a developmental perspective. Alcoholism: Clinical & Experimental Research, 25(3), 473-477.

Schulenberg, J., Wadsworth, K. N., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1997). Adolescent risk factors for binge drinking during the transition to young adulthood: Variable- and pattern-centered approaches to change. In G. A. Marlatt & G. R. VandenBos (Eds.), *Addictive behaviors: Readings on etiology, prevention, and treatment* (pp. 129-165). Washington, DC: American Psychological Association.

Statistics Canada. (2003). *Canadian Community Health Survey (CCHS)*. Ottawa, ON: Author.

Stockwell, T., & Single, E. (1999). Reducing harmful drinking. In S. Peele & M. Grant (Eds.), *Alcohol and pleasure: A health perspective*. Levittown, PA: Brunner/Mazel.

Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Prevention. (1999). *Preventing problems related to alcohol availability: Environmental approaches*. Rockville, MD: Substance Abuse and Mental Health Services Administration.

Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism. (2002). *How to reduce high-risk college drinking: Use proven strategies, fill research gaps*. Bethesda, MD: National Institutes of Health.

U.S. Department of Education Safe and Drug-Free Schools Program. (2002). *Alcohol and other drug prevention on college campuses: Model programs*. Washington, DC: Author.

Vicary, J. R., & Karshin, C. M. (2002). College alcohol abuse: A review of the problems, issues, and prevention approaches. *The Journal of Primary Prevention, 22*(3), 299-331.

Vik, P. W., Cellucci, T., & Ivers, H. (2003). Natural reduction of binge drinking among college students. *Addictive Behaviors, 69*(1), 15-21.

Walters, S. T., & Bennett, M. F. (2000). Addressing drinking among students: A review of the empirical literature. *Alcoholism Treatment Quarterly, 18*, 61-77.

Walters, S. T., Bennett, M. F., & Noto, J. V. (2000). Drinking on campus: What do we know about reducing alcohol use among college students? *Journal of Substance Abuse Treatment, 19*, 223-228.

Wechsler, H., & Isaac, N. (1992). 'Binge' drinkers at Massachusetts Colleges. *Journal of the American Medical Association, 267*(21), 2929-2931.

Wechsler, H., & Kuo, M. (2000). College students define binge drinking and estimate its prevalence: Results of a national survey. *Journal of American College Health, 49*(2), 57-64.

Wechsler, H., & Kuo, M. (2003). Watering down the drinks: The moderating effect of college demographics on alcohol use of high-risk groups. *American Journal of Public Health, 93*(11), 1929-1933.

Wechsler, H., Lee, J. E., Hall, J., Wagenaar, A. C., & Lee, H. (2002). Secondhand effects of student alcohol use reported by neighbors of colleges: The role of alcohol outlets. *Social Science & Medicine, 55*, 425-435.

Wechsler, H., Lee, J. E., Kuo, M., Seibring, M., Nelson, T. F., & Lee, H. (2002). Trends in college binge drinking during a period of increased prevention efforts: Findings from 4 Harvard School of Public Health College Alcohol Study surveys: 1993-2001 [corrected] [published erratum appears in J AM COLL HEALTH 2002 Jul; 51(1), 37]. *Journal of American College Health, 50*(5), 203-217.

Wechsler, H., Lee, J. E., Nelson, T. F., & Kuo, M. (2002). Underage college students' drinking behavior, access to alcohol, and the influence of deterrence policies: Findings from the Harvard School of Public Health College Alcohol Study. *Journal of American College Health, 50*(5), 223-236.

Wechsler, H., & Nelson, T. F. (2001). Binge drinking and the American college student: What's five drinks? *Psychology of Addictive Behaviors, 15*, 287-291.

Wechsler, H., Nelson, T. F., Lee, J. E., Seibring, M., Lewis, C., & Keeling, R. P. (2003). Perception and reality: A national evaluation of social norms marketing interventions to reduce college students' heavy alcohol use. *Journal of Studies on Alcohol, 64*(4), 484-494.

Wechsler, H., Nelson, T., & Weitzman, E. (2000). From knowledge to action: How Harvard's College Alcohol Study can help your campus design a campaign against student alcohol abuse. *Change, 32*(1), 38-43.

Wechsler, H., Seibring, M., Liu, I. C., & Ahl, M. (2004). Colleges respond to student binge drinking: Reducing student demand or limiting access. Journal of American College Health, 52(4), 159-168.

Weitzman, E. R., Folkman, A., Folkman, M. P. H., & Wechsler, H. (2003). The relationship of alcohol outlet density to heavy and frequent drinking and drinking-related problems among college students at eight universities. *Health & Place*, *9*(1), 1-6.

Weitzman, E. R., & Kawachi, I. (2000). Giving means receiving: The protective effect of social capital on binge drinking on college campuses. *American Journal of Public Health*, *90*(12), 1936-1939.

Weitzman, E. R., Nelson, T. F., Lee, H., & Wechsler, H. (2004). Reducing drinking and related harms in college: Evaluation of the "A Matter of Degree" program. *American Journal of Preventive Medicine*, *27*(3), 187-196.

Weitzman, E. R., Nelson, T. F., & Wechsler, H. (2003). Taking up binge drinking in college: The influences of person, social group, and environment. *Journal of Adolescent Health*, *32*(1), 26-35.

Werch, C. E., Pappas, D. M., Carlson, J. M., DiClemente, C. C., Chally, P. S., & Sinder, J. A. (2000). Results of a social norm intervention to prevent binge drinking among first-year residential college students. *Journal of American College Health*, *49*(2), 85-92.

Wolburg, J. M. (2001). The "risky business" of binge drinking among college students: Using risk models for PSAs and anti-drinking campaigns. *Journal of Advertising*, *30*(4), 23-39.

World Health Organization. (2004). *Global Status Report: Alcohol policy*. Geneva, Switzerland: Author.

Yanovitzky, I., & Stryker, J. (2001). Mass media, social norms, and health promotion efforts: A longitudinal study of media effects on youth binge drinking. *Communication Research*, *28*(2), 208-239.

Ziemelis, A., Bucknam, R. B., & Elfessi, A. M. (2002). Prevention efforts underlying decreases in binge drinking at institutions of higher education. *Journal of American College Health*, *50*(5), 238-252.

Appendix I: Arguments against the term "binge drinking" and the definition of five drinks for men, four drinks for women

Use of the term "binge drinking" and the definition of five drinks for men or four for women (the 5/4 definition) have been criticized by some researchers. One criticism is that the term "binge" is associated more with a two- or three-day "bender" (extended episode of abusive drinking), which may result in students failing to identify their drinking behaviours as binging (DeJong, 2001, 2003; Lederman et al., 2003). Lederman, Stewart, Goodhart and Laitman (2003) have suggested using the term "dangerous drinking" instead, since it is a term suggested by students and focused more on the outcomes of drinking rather than a set number of drinks. DeJong (2001) also suggests that the focus should not be on "alcohol consumption per se but on the negative consequences of drinking" (p. 292), and points out that the National Institute of Alcohol Abuse and Alcoholism has never endorsed use of the term and that the Journal of Studies on Alcohol uses the term "heavy episodic drinking" instead.

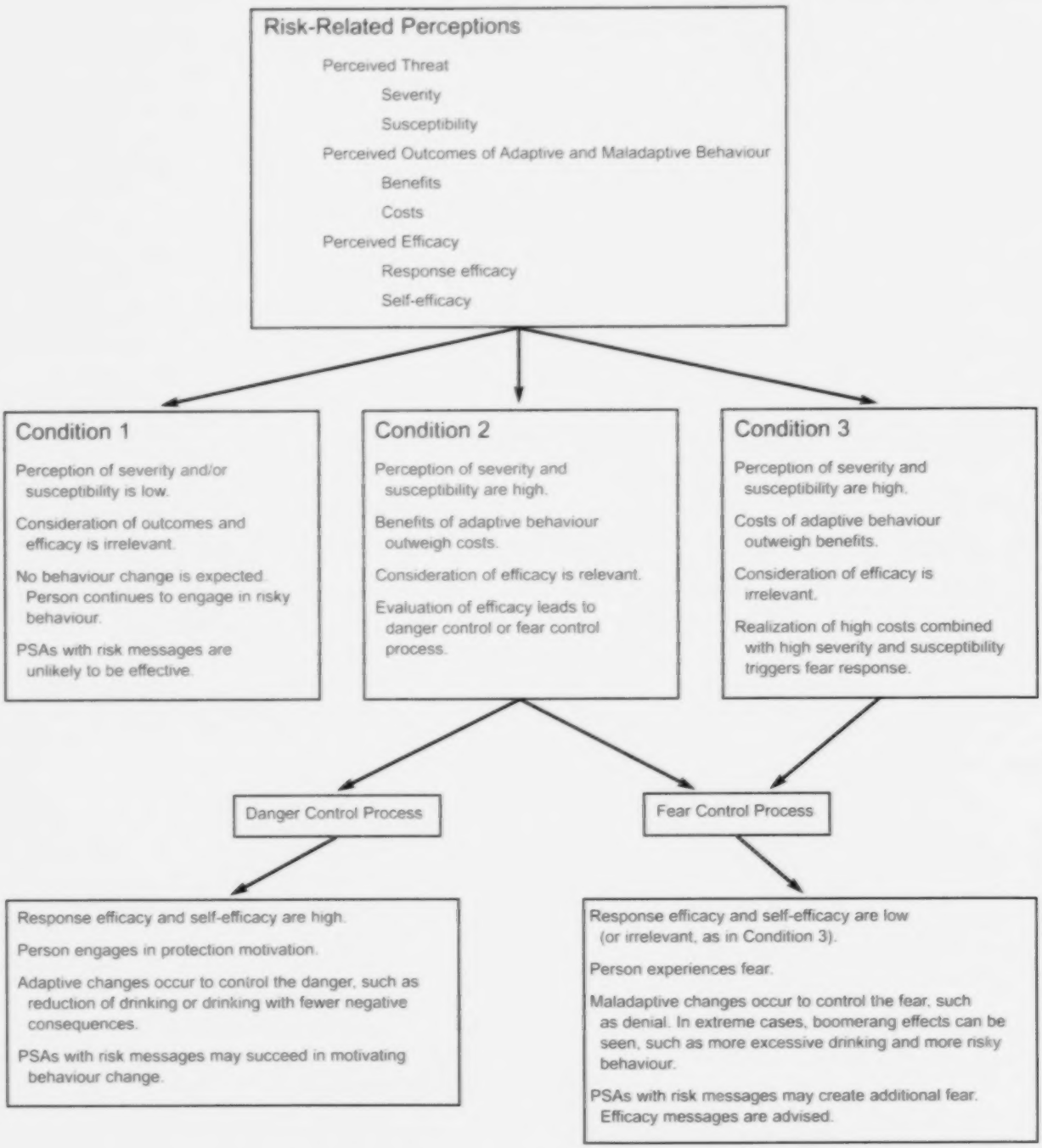
Other criticisms of the definition include that it

- fails to take into account several factors known to mediate alcohol's effects, such as the time period over which drinks are consumed, body weight, drinking history, or food consumption (DeJong, 2003)
- creates a dichotomy that suggests drinking anything under binging rates is safe (DeJong, 2003)
- makes it hard to see the success of programs that may reduce someone's drinking from, for example, ten to five drinks

Defense of the term and definition

Despite these criticisms, the use of the term and the 5/4 definition have been defended. Ziemelis, Bucknam, and Elfessi (2002) argue that though the definition "may fail to equate with high-risk consumption for some individuals under some circumstances...on average, students who consume alcohol at these levels experience significantly more problematic consequences than those who do not" (p. 238). Wechsler and Nelson (2002) point out that one advantage of the 5/4 drink measure is that it is used extensively in population-based research, making results comparable across studies. However, in a recent publication, Wechsler, Nelson, Lee, Seibring, Lewis, and Keeling (2003) switched to the term "heavy episodic drinking," but kept the 5/4 definition.

Appendix II: Integrated Risk Perception Model


Risk-Related Perceptions
Perceived Threat
Severity
Susceptibility
Perceived Outcomes of Adaptive and Maladaptive Behaviour
Benefits
Costs
Perceived Efficacy
Response efficacy
Self-efficacy
Condition 1
Perception of severity and/or susceptibility is low.
Consideration of outcomes and efficacy is irrelevant.
No behaviour change is expected. Person continues to engage in risky behaviour.
PSAs with risk messages are unlikely to be effective.
Condition 2
Perception of severity and susceptibility are high.
Benefits of adaptive behaviour outweigh costs.
Consideration of efficacy is relevant.
Evaluation of efficacy leads to danger control or fear control process.
Condition 3
Perception of severity and susceptibility are high.
Costs of adaptive behaviour outweigh benefits.
Consideration of efficacy is irrelevant.
Realization of high costs combined with high severity and susceptibility triggers fear response.
Danger Control Process
Fear Control Process
Response efficacy and self-efficacy are high.
Person engages in protection motivation.
Adaptive changes occur to control the danger, such as reduction of drinking or drinking with fewer negative consequences.
PSAs with risk messages may succeed in motivating behaviour change.
Response efficacy and self-efficacy are low (or irrelevant, as in Condition 3).
Person experiences fear.
Maladaptive changes occur to control the fear, such as denial. In extreme cases, boomerang effects can be seen, such as more excessive drinking and more risky behaviour.
PSAs with risk messages may create additional fear. Efficacy messages are advised.

(Source: Wolburg, 2001)

Appendix III: Criteria for levels of evidence in SAMHSA study

Strong level of evidence

Criteria

a. consistent positive results of strong or medium effect from a series of studies, including at least three well-executed studies of experimental or quasi-experimental design OR two well-executed studies of experimental or quasi-experimental design AND consistent results from at least three case studies

b. the use of at least two different methodologies

c. unambiguous time ordering of intervention and results

d. a plausible conceptual model ruling out or controlling for alternative causal paths or explanations

Medium level of evidence

Criteria

a. consistent positive results from a series of studies, including at least two well-executed studies with experimental or quasi-experimental designs OR at least one well-executed study and three prevention case studies showing statistically significant or qualitatively clear effects

b. the use of at least two different methodologies

c. unambiguous time ordering of intervention and results when so measured

d. a plausible conceptual model, whether or not competing explanations have been ruled out

Suggestive but insufficient evidence

Criteria

This category is used to describe research and/or practice evidence that (1) is based on a plausible conceptual model or on previous research and (2) is being demonstrated in rigorous evaluation studies or appropriate intervention programs currently in process. One of two conditions typically causes evidence to be described as suggestive but insufficient:

a. In the first condition, the evidence, although limited, appears to support a conclusion, but additional research is needed to fully support the conclusion. This condition often applies to areas in which there has been little study, such as those that are impractical to research or new areas of study.

b. A second condition involves equivocal results. In this condition, a specific conclusion is supported in some studies but is not supported in others.

Substantial evidence of ineffectiveness

Criteria

This category describes research and practice evidence demonstrating that a prevention approach is not effective. The criterion for inclusion in this category is the absence of a statistically significant effect or a statistically significant negative effect in a majority of well-executed studies, including at least two quantitative studies with sample sizes sufficient to test for the significance of the effect.

(Source: Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Prevention, 1999)

Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

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R-635A

ISBN 0-7785-3894-X